UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/534,070	05/06/2005	Wilhelm Merkens	DN 02-017	2766

7590 10/10/2008

Leon Nigohosian, Jr.
Specialty Minerals Inc./Mintsq International Inc.
1 Highland Avenue
Bethlehem, PA 18017-9482

EXAMINER	
BALL, JOHN C	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
10/10/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/534,070	MERKENS ET AL.	
	Examiner	Art Unit	
	J. CHRISTOPHER BALL, Ph.D.	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Summary

1. This is the initial Office Action based on the MERKENS et al. National Entry Stage ("371") application filed under the Patent Cooperation Treaty (PCT) on November 20, 2003

2. Claims 1-18 are currently pending and have been fully considered.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

4. The disclosure is objected to because of the following informalities: on the seventh page of the submitted specification, at line 11 is recited the term "zylindrical", which is believed to be a misspelling of the term "cylindrical".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by KNEVELS et al. (US 2002/0100686 A1).

KNEVELS discloses a measuring device for determining the oxygen activity in metal melts, wherein is taught the device comprises:

a reference material (3, Figure 1) in electrically conducting contact with a measuring device (5, Figure 1); and

comprising a solid electrolyte (1, Figure 1) implicitly predominantly oxygen ion conducting at high temperatures and negligibly electron conducting, as the solid electrolyte is composed of zirconium dioxide, and separating the reference substance from the melt and having an entry surface for oxygen ions in contact with the melt (Figure 1), wherein the entry surface of the probe ready for operation is covered by a functional foil arrangement in close contact to the entry surface, in the form of a steel tube (2, Figure 1).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over KNEVELS et al. (US 2002/0100686 A1).

Regarding claim 7, KNEVELS teaches the solid electrolyte is in a tube shape (1, Figure 1), and that the foil arrangement, in the form of a steel tube (2, Figure 1), completely extends to the whole surface of the solid electrolyte, save the connection end (Figure 1). To make the solid electrolyte tube and foil arrangement covering it with a flat end wall would be a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive

evidence that the particular configuration of a flat end wall was significant (*In re Dailey*, 257 F.2d 669, 149 USPQ 47 (CCPA 1966).

Regarding claim 8, KNEVELS teaches the solid electrolyte (1, Figure 1) is provided in a form of small tube to be immersed into the melt and closed at the end to be immersed (paragraph [0012]) with the reference substance (3, Figure 1) being located in the interior of the small tube and that the foil arrangement (2, Figure 1) totally and tightly surrounds the outer periphery of the small tube.

Regarding claims 9, KNEVELS does not explicitly teach a means to keep the foil arrangement in close contact to the entry surface, however, from Figure 1, there is little to no spacing between the entry surface of the solid electrolyte (1, Figure 1) and the foil arrangement (2, Figure 1). Additionally, the snap connector of the cap (7 and inset figure, Figure 1) would hold the foil arrangement to the entry surface of the solid electrolyte, in addition to its state function is to prevent moisture from the interior of solid electrolyte.

10. Claims 2, 3, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over KNEVELS et al. (US 2002/0100686 A1) in view of FRAY et al. (GB 1,594,223).

Regarding claims 2 and 3, KNEVELS teaches the limitations of claim 1, as outlined above.

KNEVELS does not teach that the foil arrangement comprises at least one foil oxidizable by the oxygen contained in the melt.

However, FRAY discloses a probe for the determination of hydrogen in a metal melt, wherein is taught attachment to the outside surface of a solid electrolyte of aluminum foil (page 2, lines 22-25), which is inherently oxidizable by the oxygen contained in the melt.

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the probe as taught by KNEVELS with the aluminum foil as taught by FRAY because the aluminum foil seals the solid electrolyte from the atmosphere prior to use (FRAY, page 2, lines 20-25).

Regarding claim 10, KNEVELS teaches the limitations of claims 1 and 9, as outlined above.

KNEVELS does not explicitly teach a means to keep the foil arrangement in close contact with the entry surface comprises a binder.

However, FRAY discloses use of an impact adhesive, which is a binder, between the solid electrolyte and foil arrangement (page 2, lines 23-28). Such an impact adhesive would inherently disintegrate at the normal temperatures of metal melts intend to be monitored by the probe.

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the probe as taught by KNEVELS with the aluminum foil affixed with the impact adhesive as taught by FRAY because the aluminum foil seals the solid electrolyte from the atmosphere prior to use (FRAY, page 2, lines 20-25).

11. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over KNEVELS et al. (US 2002/0100686 A1) in view of FRAY et al. (GB 1,594,223) as applied to claims 2, 3, and 10 above, and further in view of MISENER et al. (US 3,755,126).

Regarding claims 4-6, KNEVELS teach the limitations of claim 1, and as modified by FRAY, teaches the limitations of claim2, as outlined above.

KNEVELS does not explicitly teach that the foil arrangement comprises more than one foil. However, when modified by FRAY, the device taught by KNEVELS has a foil with a particular functionality, namely that the aluminum foil prevents atmospheric exposure of the solid electrolyte prior to use.

MINSENER discloses a probe for the determination of oxygen in a molten metal, wherein is taught a foil covering in the form a fugitive cap (318, Figure 3; 418, Figure 4; 518, Figure 5), which can be formed of copper (Col. 11, lines 58-60) that melts due to contact with the melt (Col. 11, lines 42-44) and inherently enhances the wettability of the entry surface of the solid electrolyte.

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the combined device of KNEVELS and FRAY with the copper cap as taught by MISENER because the cap forms a protective end on the probe (Col. 12, lines 51-53).

12. Claims 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over KNEVELS et al. (US 2002/0100686 A1) in view of FRAY et al. (GB 1,594,223) as applied to claims 2, 3, and 10 above, and further in view of KOBAYASHI et al. (US 4,969,835).

Regarding claims 11-16, KNEVELS teaches the limitations of claims 1 and 9, and as modified by FRAY, teaches the limitations of claim 10, as outlined above.

KNEVELS and FRAY do not explicitly teach the means to keeping the foil arrangement in close contact with the entry surface of the solid electrolyte is a mechanical means pressing from the outside.

However, KOBAYASHI discloses a thermoactive shape memory fitting, wherein is taught use of the thermoactive shape memory fitting to hold a flexible printed circuit board (analogous to a foil) in close contact with an ITO substrate (analogous to a solid electrolyte) (Figure 3, lower). This type of connector is a mechanical means that would press the foil in an elastic way against the entry surface of the solid electrolyte, and has a greater diameter than the foil analog

and would be shrinkable in its radial diameter as evidenced in the shape transformation shown in Figure 3 of KOBAYASHI.

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to utilize the thermoactive shape memory fitting as taught by KOBAYASHI as part of the modified device of KNEVELS and FRAY because thermoactive shape memory fitting works reliably at high temperatures in use over a long term (Col. 2, lines 46-52).

Regarding claims 17 and 18, KNEVELS discloses a measuring device for determining the oxygen activity in metal melts, wherein is taught the device comprises:

a reference material (3, Figure 1) in electrically conducting contact with a measuring device (5, Figure 1); and

comprising a solid electrolyte (1, Figure 1) implicitly predominantly oxygen ion conducting at high temperatures and negligibly electron conducting, as the solid electrolyte is composed of zirconium dioxide, and separating the reference substance from the melt and having an entry surface for oxygen ions in contact with the melt (Figure 1), wherein the entry surface of the probe ready for operation is covered by a functional foil arrangement in close contact to the entry surface, in the form of a steel tube (2, Figure 1).

FRAY discloses a probe for the determination of hydrogen in a metal melt, wherein is taught attachment to the outside surface of a solid electrolyte of

aluminum foil (page 2, lines 22-25), which is inherently oxidizable by the oxygen contained in the melt.

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to modify the probe as taught by KNEVELS with the aluminum foil as taught by FRAY because the aluminum foil seals the solid electrolyte from the atmosphere prior to use (FRAY, page 2, lines 20-25).

KNEVELS and FRAY do not teach an elastic hose positioned longitudinally and that the hose is shrunk onto the foil causing radial tension to lead to close contact between foil arrangement and the entry surface of the solid electrolyte.

However, KOBAYASHI discloses a thermoactive shape memory fitting, wherein is taught use of the thermoactive shape memory fitting to hold a flexible printed circuit board (analogous to a foil) in close contact with an ITO substrate (analogous to a solid electrolyte) (Figure 3, lower). The thermoactive shape memory fitting is shown positioned longitudinally and then shrunk to cause radial tension (Figure 3).

At the time of the present invention, it would have been obvious to one of ordinary skill in the art to utilize the thermoactive shape memory fitting as taught by KOBAYASHI as part of the modified device of KNEVELS and FRAY because thermoactive shape memory fitting works reliably at high temperatures in use over a long term (Col. 2, lines 46-52).

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. CHRISTOPHER BALL, Ph.D. whose telephone number is (571)270-5119. The examiner can normally be reached on Monday through Thursday, 8:00 am to 5:00 pm (EDT).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

JCB
Au 1795